AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A control system for regulating vehicle emissions comprising:

a valve that controls recirculation of exhaust gas in an engine;

a sensor that communicates with the exhaust gas to measure an oxides of nitrogen level~~s~~;

a controller that communicates with the sensor and the valve, that determines an expected oxides of nitrogen level based on a desired air per cylinder (APC) and that ~~wherein the processor~~ adjusts the valve if a difference between the expected oxides of nitrogen level and the oxides of nitrogen level~~s are~~ is not within a threshold.

2. (Original) The control system of claim 1 wherein the threshold is determined by a calibration map generated on the controller.

3. (Original) The control system of claim 2 wherein the calibration map is a predetermined lookup table.

4. (Currently Amended) The control system of claim 3 wherein the controller ~~processor~~ adjusts the valve according to the lookup table.

5. (Original) The control system of claim 3 wherein the lookup table determines the threshold based on an accelerator pedal position and an engine speed.

6. (Original) The control system of claim 1 wherein the controller diagnoses valve malfunctions based on the oxides of nitrogen levels.

7. (Original) The control system of claim 5 wherein the controller diagnoses valve malfunctions if the oxides of nitrogen levels are not within a threshold for a period.

8. (Original) The control system of claim 4 wherein the controller diagnoses valve malfunctions if the oxides of nitrogen levels are not within a threshold after the controller adjusts valve performance.

9. (Currently Amended) A control system for regulating vehicle emissions comprising:

a cam phaser that controls a position of a camshaft, wherein the position affects exhaust gas in an engine;

a sensor that communicates with the exhaust gas to measure oxides of nitrogen levels;

a controller that communicates with the sensor and the cam phaser, that determines an expected oxides of nitrogen level based on a desired air per cylinder (APC) and that ~~wherein the processor~~ adjusts the cam phaser if a difference between the expected oxides of nitrogen level and the oxides of nitrogen level~~s are~~ is not within a threshold.

10. (Original) The control system of claim 9 wherein the threshold is determined by a calibration map generated by the controller.

11. (Original) The control system of claim 10 wherein the calibration map is a predetermined lookup table.

12. (Currently Amended) The control system of claim 11 wherein the controller ~~processor~~ adjusts the cam phaser according to the lookup table.

13. (Original) The control system of claim 11 wherein the lookup table determines the threshold based on an accelerator pedal position and an engine speed.

14. (Original) The control system of claim 9 wherein the controller diagnoses cam phaser malfunctions based on the oxides of nitrogen levels.

15. (Original) The control system of claim 14 wherein the controller diagnoses cam phaser malfunctions if the oxides of nitrogen levels are not within a threshold for a period.

16. (Original) The control system of claim 14 wherein the controller diagnoses cam phaser malfunctions if the oxides of nitrogen levels are not within a threshold after the controller adjusts cam phaser performance.

17. (Currently Amended) A method for reducing NOx levels in vehicle emissions comprising:

measuring NOx levels in exhaust gas in an engine;

controlling exhaust gas recirculation in an engine;

calculating an expected NOx level based on a desired air per cylinder (APC); and

communicating the NOx levels to a controller wherein the controller adjusts the exhaust gas recirculation in the engine if a difference between the expected NOx level and the NOx levels exceeds a threshold.

18. (Original) The method according to claim 17 further comprising:

generating a calibration map at the controller; and

determining a threshold at the calibration map.

19. (Original) The method according to claim 17 wherein the controller adjusts the exhaust gas recirculation in the engine if the NOx levels exceed the threshold for a period.

20. (Original) The method according to claim 18 wherein the controller adjusts the exhaust gas recirculation according to the calibration map.

21. (Original) The method according to claim 20 further comprising determining the threshold based on an accelerator pedal position and an engine speed.